OKUMA MACHINING CENTER OPERATORS GUIDE
OSP P200M THiNC
OKUMA MACHINING CENTER OPERATORS GUIDE

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SCOPE

This Operators Guide was compiled for use by our Okuma Machining Center customers. It addresses basic day to day operation of the machine. The procedures were written for the OSP P200M THiNC controls.

This Operators Guide should be used as a reference and in no way replaces or supersedes the Okuma manuals provided with your machine.

The procedures in this manual have been tested and proven. However, it is impossible for us to foresee how you will apply the procedures within. Machine Tool Systems LLC assumes no liability due to typographical errors, or misrepresentations in this manual. This manual has not been endorsed by Okuma Machinery Inc.
Section 1

Guide to Controls on Operation Panels

Operation Mode Selection Keys

(1) [AUTO] Key
Pressed to select the automatic operation mode, in which a part program stored in the memory disk (MD) is read to the working memory of the NC and executed.

(2) [MDI] Key
Pressed to select the MDI operation mode, in which a program is written one block at a time from the keyboard of the NC operation panel and executed in the same way as in automatic operation.

(3) [MANUAL] Key
Pressed to select the manual operation mode, in which the manual operation switches on the machine operation panel, pulse handle operation box, etc., are used to operate the machine.

Data Setting Mode Selection Keys

(1) [EDIT AUX.] Key
Pressed to select the program operation mode, in which program files and data files can be edited, punched, printed, displayed, and deleted.

(2) [PARAMETER] Key
Pressed to select the parameter mode, in which the following parameters are set: system parameter, user parameter, common variables, NC optional parameter, machine system parameter and machine user parameter.

(3) [ZERO SET] Key
Pressed to select the zero set mode, in which the zero offset data is set.

(4) [TOOL DATA] Key
Pressed to select the tool data mode, in which the tool length offset data, cutter radius compensation data, ATC tool data, and tool management data can be set, changed, or displayed.

(5) [MacMan] Key
Pressed to select the MacMan mode, in which the machining management function can be used.
NC Status Indicating Lamps

The lamps indicating the following states are displayed in the upper part of the screen.

1. [RUN] Lamp
   This lamp is lit while the machine is actually operating in the automatic or MDI mode.

2. [S.T.M] Lamp
   This lamp is lit while S (spindle), T (tool), or M (miscellaneous) operation is being executed.

3. [SLIDE HOLD] Lamp
   This lamp goes on when the [SLIDE HOLD] button is pressed.

4. [PROGRAM STOP] Lamp
   This lamp is lit during a program stop (M00) or optional stop (M01) in the automatic or MDI mode.
   It blinks during dwell (G04).

5. [LIMIT] Lamp
   This lamp goes on when an axis reaches the variable limit position.

6. [ALARM] Lamp
   This lamp goes at the occurrence of an alarm.
   Note that it does not light when a warning message is displayed due to erroneous operation.
Section 1 (cont)

Other Controls on the NC Operation Panel

(1) Function Keys: F1 to F8
When the operator selects an operation mode, the functions (operations) available in the
selected mode are displayed on the bottom line of the screen. The function keys (F1 to F8)
correspond to the displays for individual functions, and the functions are executed by pressing
the corresponding function key.
Only those functions that are valid in the current step of an operation and the currently selected
mode are displayed.

F1  F2  F3  F4  F5  F6  F7  F8

(2) Help Key
This key is located to the left of function key [F1].
It is used to display descriptions of alarms which occur during
machine operation, and the alarm history.

(3) Extend key
This key is located to the right of function key [F8].
It is functional only when a triangular mark is displayed at the right
end of the function menu. It is used when all of the accessible items
in a function menu cannot be displayed at one time; pressing the
[Extend] key changes the function menu.

(4) [WRITE] Key
Press this key to select an operation, and to confirm data after
inputting it.

(5) [BS] (Backspace) Key
Used when you have made a mistake in inputting data. Pressing this
key deletes the character input last.

(6) [CANCEL] Key
Used when you have made a mistake in inputting data. Pressing this
key deletes a line of data that has not been confirmed.

(7) Cursor Keys
These keys move the screen cursor in the directions indicated on
the keys.

(8) Page Keys
If the information called out is displayed in more than one page, the
page keys are used to change the display page.

(9) Operator Keys
These keys are used when multiple data have to be input with
operators during program editing or when setting data.
Section 1 (cont)

(10) Character Keys
Character keys are used to input characters for data input, program operation, and file editing operations.
To input the character shown at the upper right corner of a key top, press the key while holding down the [UPPER CASE] key.
While the [CAPS LOCK] key is pressed (indicating lamp at the upper left corner of the key lit), these input upper case letters of the alphabet (A to Z). When the [CAPS LOCK] key is not pressed, lower case letters (a to z) are input.

(11) Ten Keys
The ten keys are used to input numbers for data input, program operations, and file editing operations.

![Character Keys Diagram]

![Ten Keys Diagram]
Section 1 (cont)

**Controls on the Machine Operation Panel**

The flat keys on the machine operation panel have the features indicated below depending on whether or not they have indicating lamps.

- Flat keys with an indicating lamp:
The indicating lamp in a key indicates if the function of the key is valid or not.
  - Indicating lamp lit: Key function is valid.
  - Indicating lamp unlit: Key function is invalid.

- Flat keys without an indicating lamp:
The function of the key is in effect only while the key is held down. While the key is not being pressed, the function is not in effect.

1. **[CONTROL ON] Switch**
   - It operates only after the main switch of the machine has been turned on.
   - The pilot lamp in this switch lights when the control power is turned on.
   - If the [EMERGENCY STOP] button is pressed, the pilot lamp in this switch goes off. To recover from the emergency stop state, press the [CONTROL ON] switch again.

2. **[CONTROL OFF] Switch**
   - When shutting off the power, turn off the control power first by pressing the [CONTROL OFF] switch before turning off the main switch of the machine.

3. **[RESTART] Switch**
   - This switch is used, for example, to restart the operation which has been interrupted due to the door interlock function. To restart the suspended operation, press the [RESTART] switch and then the [CYCLE START] button.

4. **[RESET] Switch**
   - Used to recover normal operation when the machine is in the stopped state due, for example, to an alarm.

5. **[NC PANEL] Switch**
   - When the UNLOCK position is selected, all operations at the NC and machine operation panels are enabled.
   - When the EDIT LOCK position is selected, operations in the program operation EDIT AUX mode and PARAMETER mode are disabled.
   - When the LOCK position is selected, all operations at the NC operation panel are disabled.
Section 1 (cont)

(6) [CYCLE START] Button
The [CYCLE START] button is used to start machine operation as directed by the commands that have been given. The CYCLE START signal is output when this button is released after being pressed.

(7) [SLIDE HOLD] Button
Pressing this button stops motion on the X-, Y-, and Z-axis immediately. To resume axis movements, press the [CYCLE START] button. If none of the X-, Y-, and Z-axes is moving when this button is pressed, the slide hold state is established when the current sequence is completed, or when the next axis motion starts.

(8) [EMG. STOP] Button
This shuts off the power supply to the machine with the NC power kept active. To release the emergency stop state, unlock the [EMG. STOP] button and press the [CONTROL ON] button.

(9) [AXIS SELECT] Keys
These keys are used to select the axis to be moved manually (rapid feed, cutting feed). To move an axis using the pulse handle, select [PULSE HANDLE].

(10) [RAPID] Keys
These keys are used to move the axis selected by the [AXIS SELECT] key at a rapid traverse rate in the direction indicated in a key. The selected axis moves at a rapid traverse rate only while the [RAPID] key is held pressed. Rapid traverse rate differs depending on the machine model and specifications.
Section 1 (cont)

(11) [JOG] Keys
These keys are used to move the axis selected by the [AXIS SELECT] key at a cutting feedrate in the direction indicated in a key.
Once a key is pressed, the axis keeps moving even if it is released. To stop axis feed, press the [STOP] key.
Cutting feedrate differs depending on the machine model and specifications.

(12) [SPINDLE STOP] Key
Used to stop the spindle manually.

(13) [SPINDLE CW] Key
Used to start the spindle in the forward CW direction.

(14) [SPINDLE CCW] Key
Used to start the spindle in the reverse CCW direction.

(15) [SPINDLE ORIENTATION] Key
Used to stop the spindle at the preset angular position.
To execute spindle orientation, press the [SPINDLE ORIENTATION] key while pressing the [INTERLOCK RELEASE] button.

(16) [SPINDLE RELEASE] Key
Used to set the spindle free (neutral position).
Spindle speeds differ depending on the machine model and specifications.

(17) [SPINDLE OVERRIDE] Dial
Used to set the desired override value to be applied to the spindle speed specified in a program.

(18) [RAPID OVERRIDE] Dial
Used to set the desired override value to be applied to the rapid traverse rate.

(19) [FEEDRATE] Override Dial
Used to set the desired override value to be applied to the feedrate specified in a program.
Section 1 (cont)

(20) [JOG SPEED] Dial
The [JOG SPEED] dial is used to set jog feedrate (cutting feedrate).

(21) [LIGHT] Key

(22) Door Interlock Mode Selector Switch
For details of the door interlock function, refer to the Instruction Manual for Safety Door Interlock Function separately issued.

(23) [ALL COOLANT STOP] key
Used to stop the group of coolants and air blowers regardless of the selected operation modes. The coolant and air blow group restarts operation by another depression of this key.

(24) [SETTING CONFIRMATION] key
Used to list the various settings made with each of the function selection switches. Settings can be changed on the displayed list in the same way as setting change by depression of a function selection switch. To close the list screen, press this button again.
Section 1 (cont)

**Mode Selection Keys**

These switches are used to select the operation mode for program operation.

1. **[SINGLE BLOCK] key**
   - Used to execute a program block by block.
   - When this key is valid, the indicating lamp at the upper left corner lights.
   - The [CYCLE START] button has to be pressed to execute each successive block.
   - When the [SINGLE BLOCK] key is invalid (indicating lamp at the upper left corner unlit), program blocks are executed continuously.

2. **[BLOCK SKIP] key**
   - Used to ignore the commands between a slash (/) code and “CR” code.
   - When this key is valid, the indicating lamp at the upper left corner lights.
   - When the [BLOCK SKIP] key is invalid (indicating lamp at the upper left corner unlit), commands entered after a slash code (/) are executed.

**[Supplement]**

A slash code (/) must be placed at the start of a program block or immediately after the sequence number (or sequence name) of a block.

3. **[OPTIONAL STOP] key**
   - Used to stop program operations including spindle rotation and coolant supply.
   - When this key is valid, the indicating lamp at the upper left corner lights.
   - Pressing the [CYCLE START] button in this condition recovers the state before the stop and starts continuous program execution.
   - When the [OPTIONAL STOP] key is invalid (indicating lamp at the upper left corner unlit), program execution proceeds even if a block containing M01 is executed.

4. **[DRY RUN] key**
   - Used to execute axis feed commands (commands in G01, G02, G03 mode, etc.) at the feedrate set with the [JOG SPEED] dial. The feedrate commands specified in a program are disregarded.
   - When the [DRY RUN] key is valid, the indicating lamp at the upper left corner lights.
   - When the [DRY RUN] key is invalid (indicating lamp at the upper left corner unlit), the axes are fed at the feedrates specified in the program.

**[Supplement]**

To change the dry run function ON/OFF state, press the [DRY RUN] key while holding down the [INTERLOCK RELEASE] key.
Section 1 (cont)

(5) [MACHINE LOCK] key
Used to execute a program without actual machine operations.
When the [MACHINE LOCK] key is valid, the indicating lamp at the upper left corner lights.
If a program is executed with the machine lock function ON, the actual position display is updated according to the commands as the program is run. The block data display is also updated. Resetting the CNC restores the display prior to the machine lock.
When the [MACHINE LOCK] key is invalid (indicating lamp at the upper left corner until), commands specifying machine operations are actually executed.

[Supplement]
To change the machine lock function ON/OFF state, press the [MACHINE LOCK] key while holding down the [INTERLOCK RELEASE] key.

(6) [INTERLOCK RELEASE] key
This key must be held down when the corresponding mode key is pressed in order to establish or cancel the dry run mode, machine lock mode.
The indicating lamp at the upper left corner of the key is lit, and the key function is valid, only while the key is pressed.

(7) [SEQUENCE RESTART] key
Used during program operation to start a part program from part way through.
When performing manual operation by interrupting an automatic operation by pressing the [MID AUTO MANUAL] key, the axes can be returned to the position where automatic operation was interrupted by pressing the [SEQUENCE RESTART] key.

(8) [MID AUTO MANUAL] key
Used to interrupt automatic or MDI mode operation to perform manual operation.

(9) [PULSE HANDLE SHIFT] key
Used to add axis movements performed by turning the pulse handle to the operation executed according to the commands in a part program.

(10) CYCLE STOP Key
Used to stop the operation after the completion of a main program while the operation is controlled by a schedule program.
When this key is valid, the indicating lamp at the upper left corner lights.
When the [CYCLE STOP] key is invalid (indicating lamp at the upper left corner until), the operation continues even after the completion of a main program while the operation is controlled by a schedule program.
Section 1 (cont)

**Function Selection Switch**

Switches are provided for each function. The switch configuration and whether the switch is effective not vary with the selected optional specifications.

(1) [ATC] key

Used to display the ATC operation selection screen. The screen closes when this key is pressed again.

For the ATC operation, refer to “3. ATC” in Section 3 of the OPERATION part.
Section 1 (cont)

(2) [APC] key
Used to display the APC operation selection screen. The screen closes when this key is pressed again.
For the APC operation, refer to 4. “APC” in Section 3 of the OPERATION part.

(3) [Coolant] key
Used to display the screen for selecting the coolant operation. The screen closes when this key is pressed again.
Press the function keys to start or stop discharging coolant.
Section 1 (cont)

(4) [Air blow] key
Used to display the screen for selecting the air blow operation. The screen closes when this key is pressed again. Press the function keys to start or stop air blow.
Section 1 (cont)

(5) [Mirror image] key

Used to display the screen for selecting the mirror image operation. The screen closes when this key is pressed again.
For the mirror image function, refer to 12. “Mirror Image Function” in Section 5 of the OPERATION part.

(6) [NC operation] key

Used to display the NC operation selection screen. The screen closes when this key is pressed again.
Section 1 (cont)

(7) [MIST] key
Press the [MIST] key to display the mist operation selection screen. The screen closes when this key is pressed again. The mist unit operation status alternates between start and stop by depression of the function key OIL MIST.
Section 1 (cont)

Pop-up Windows

When any of the function menu items is selected, the corresponding pop-up window is displayed. Apart from pop-up windows in which data can be set, there are also DISPLAY CHANGE pop-up windows that are used to change the screen contents.

(1) About DISPLAY CHANGE pop-up windows

To change the screen contents in an operation mode, first display the DISPLAY CHANGE pop-up window, then select the required screen. The DISPLAY CHANGE pop-up window is displayed by selecting [F8] (DISPLAY CHANGE) from the function menu on the initial screen of any mode.

MENU CHANGE

Used to set the menu displayed in the DISPLAY CHANGE pop-up window.
Section 2

MANUAL TOOL CHANGE OPERATION

1. Position the machine so you can safely remove and replace the tool.
2. Press the “TOOL CHANGE CYCLE” button
3. Hold the tool in the spindle and press the “TOOL UNCLAMP” button (there will be a three second delay before the tool is released).
4. Insert the new tool into the spindle.
5. Press the “TOOL CLAMP” button.
Section 3

Spindle Operation

If the [SPINDLE CW] or [SPINDLE CCW] key on the machine operation panel is pressed in the state a spindle speed is set using an S command in such as the MDI operation mode, the spindle starts rotating at the specified speed. Pressing the [SPINDLE STOP] key stops the spindle. The spindle speed can be changed by using the [SPINDLE OVERRIDE] dial.

Starting the Spindle

Before attempting to start the spindle, set the spindle speed using an S command in the MDI operation mode. This selects the gear range automatically. Note that an S command cannot be specified manually. Next, select the manual operation mode and press either of the [SPINDLE CW] and [SPINDLE CCW] switches while pressing the [INTERLOCK RELEASE] key. The spindle starts rotating at the speed calculated by multiplying the specified spindle speed by the set override value.

Stopping the Spindle

Press the [SPINDLE STOP] key to stop the spindle.

Releasing the Spindle

Press the [SPINDLE RELEASE] key to set the spindle drive gears in the neutral (released) position. This operation becomes valid only after the spindle has stopped. Once the spindle is released, the spindle can be rotated manually. If you start the spindle in the state the spindle is released, the previously selected spindle drive gear is selected and the spindle rotates at the speed specified by the previous S command. The spindle released state can be canceled only by spindle start operation.

Spindle Orientation

Press the [SPINDLE ORIENTATION] key while pressing the [INTERLOCK RELEASE] key to stop the spindle in the predetermined fixed position. This operation is allowed even while the spindle is rotating. The spindle starts orientation and the lamp in the [SPINDLE ORIENTATION] key blinks. The lamp is lit on completion of spindle orientation. Spindle orientation state is canceled when the spindle is started. The spindle orientation position and the spindle speed for orientation operation are set for machine system parameters.
Section 4

Work Coordinate System Zero Point

The zero point of a work coordinate system indicates the origin of a work coordinate system referenced to the zero point of the machine coordinate system. 20 sets of a work coordinate system can be set for the standard specifications of the NC and this number can be expanded to 50, 100, 200 or 400 sets.

Zero Offset Setting

Basic Procedure for Setting Zero Offset Data

To set the zero offset data of a work coordinate system, first display the PROGRAM ZERO screen by pressing the "ZERO SET" (ZERO SET) mode selection key.
Section 4 (cont)

HOW TO SET X Y & Z AXIS PROGRAM ZERO (G15 H??)

1. First you must know the radius of the edge finder.
2. Put the edge finder in a tool holder and put the tool holder in the spindle.
3. Select MDI and type in the work coordinate that you want to set “G15H??”.
4. Press <WRITE>.
5. Press <CYCLE START> (confirm active work coordinate system).
6. While in MDI type in a spindle speed “S???” (if needed).
   6a. Press <WRITE>.
   6b. Press <CYCLE START>.
7. Select MANUAL. Confirm your active work coordinate system Co?? (start spindle if needed).
8. Select ZERO SET.
9. CAREFULLY position the machine so that the edge finder is in contact with the part using the pulse handle in the X Axis direction.
10. Move the cursor over to the “X” side of the screen.
11. Press [F3] “CAL” and type in the RADIUS of your edge finder, along with the proper sign depending on the side of the piece that the edge finder is on, then press <WRITE>.

Note: in example above if we had a .1000” radius on our edge finder we would “CAL” [F3] this position as “-.1”

Repeat this procedure for “Y” axis.
HOW TO SET Z AXIS PROGRAM ZERO

When setting up a job, it is necessary to determine where the program zero point will be located. This point is determined by the part program. Here we will discuss how to set Z Axis “Part Zero” using a “Standard Length” or “Zero Set” tool. All tool length offsets are relative to our Zero Set tool. This comes in very handy when making a new set up because; only the “Zero Set” tool needs to be touched off or recalculated.

1. Put the “Zero Set” tool in the spindle, and confirm your active work Coordinate (Co??).
2. Select MANUAL.
3. Select ZERO SET.
4. Carefully position the Z axis.
5. Move the cursor over to the fixture offset and Z axis that you wish to change.
6. Press [F3] “CAL” and type in the position of your “Zero Set” tool, along with the proper sign depending on the part program zero position, and then press <WRITE>.

Note: in example above if part program zero is the top of the part we would “CAL” (F3) this position as “1.”.
Section 5

**HOW TO REGISTER TOOL NUMBERS**

1. Select **TOOL DATA**.
2. Press [F7] “ITEM ↓” or use [F8] “DISPLAY CHANGE” to display “Pot NO / TOOL NO TABLE (MEMORY-RANDOM)”.

![Screen Shot](image.jpg)

3. Move cursor to the pot number you want to set.
5. Type in the tool number and press **WRITE**.
Section 6

**HOW TO SET A TOOL LENGTH OFFSET**

Once our Zero Set or Program Zeros have been set we can now set our tool length offsets for our remaining tools.

1. Place all tools to be set into their proper pot positions paying close attention to the tools orientation.

2. Select either **MANUAL** or **MDI** and put the proper tool to be set into the spindle.
   1a. For Manual set up Select “ATC” from the “Function Switch”.
   2a. Move cursor to the “NXT TOOL NO.”.
   3a. Press [F1] “SET”.
   4a. Type in the tool number and press <WRITE>.
   6a. Press [F3] “1 CYCLE START”.

**NOTE:** Pressing “1 CYCLE START” will orient the spindle, move all axes to their tool change position and change the tool at about 50% of tool changer speed.

1b. For MDI set up, select MDI.

2b. Type in Tool number (T?? M6).

3b. Press <WRITE>.

4b. Press <CYCLE START>.

**NOTE:** Pressing <CYCLE START> will orient the spindle, move all axes to their tool change position and change the tool at 100% tool changer speed.

3. Select **MANUAL**.

5. Using the Pulse Handle position the tool to known reference point.
Section 6 (cont)

6. Move the cursor to the “Tool Length Offset” side of the screen, and to the tool number being set.

7. Press [F3] “CAL” and type in the position of your tool, along with the proper sign depending on the part program zero position, and then press <WRITE>.

8. Move your cursor to the “Cutter R Comp” (if needed).

9. Press [F1] “SET” and type in the tool RADIUS.


Repeat all steps for each tool to be touched off.

Note: in example above if part program zero is the top of the part we would “CAL” (F3) this position as “1.”.
Section 7

TOOL SHAPE DEFINITION

1. Select TOOL DATA.

3. Use PAGE keys to change tool number or press [F1] “SET” and type in tool number and then press <WRITE>.
4. Move cursor to “TOOL NAME”.
5. Press [F1] “SET”.
6. Move cursor to select a tool type and then press <WRITE>.
7. Move cursor to “TOOL DIMENSION”.
8. Press [F1] “SET” and enter all tool data including H & D. H & D values will be transferred from the tool offset compensation page. If multiple offsets for a tool are used you can enter the offset numbers here.
Section 8

HOW TO SELECT A PROGRAM TO RUN IN AUTO MODE

1. Select AUTO.
2. Press [F1] “MAIN PRG_OPER” from the function menu.
3. Press [F1] “PROGRAM SELECT”.
4. The MAIN PROGRAM SELECT pop-up window is displayed.
5. Move cursor to the program name you want to select.
6. Press <WRITE>.
7. Confirm “RUNNING METHOD”.
   - A Method “A-MTD” is the most common and is used when the program is smaller than the operation buffer.
   - B Method “B-MTD” is used when the program is larger than the buffer. The program is called to the buffer in several segments. This method is commonly used when a program is large and calls branch and / or subprograms.
   - S Method “S-MTD” is used when the program is larger than the buffer, but does not use branch or subprograms.
8. Press <WRITE> again, the program is now active.
9. Verify that the correct program name is visible at the top of the display screen.

NOTE:
Machine may not be in cycle when selecting a program. Use the RESET button to cancel program before using the above procedure.
Section 9
HOW TO RESTART A PROGRAM

NOTE: The tool(s) must be away from the part to safely execute a sequence restart. If this condition is not met, the tool may not have a clear path to the start point.

NOTE: CONFIRM THE CORRECT TOOL IS IN THE SPINDLE.

Restarting a part program (Method 1)
1. Select AUTO.
2. Press [F1] “MAIN PRG_OPER”.
4. Enter the sequence name where you want to start (this should be on the spindle start line of the tool you have in the spindle).
5. Confirm axis movement order setting & spindle tool.
6. Press [F7] “OK” (the program will search for the restart position).
7. Turn SINGLE BLOCK “ON”, FEEDRATE OVERRIDE, JOG FEED and RAPID OVERRIDE to zero (or very slow).
8. Press <SEQUENCE RESTART> (the tool will move to its starting position as the jog feed is increased).
9. Once the run light goes out, you can adjust your SINGLE BLOCK, FEEDRATE & RAPID settings.
10. Press <CYCLE START> and continue on with the program.

Restarting a part program (Method 2)
1. Place the correct tool in the spindle.
2. In AUTO.
3. Cursor down in the program to the start point start (this should be on the spindle start line of the tool you have in the spindle).
4. Press <CYCLE START>.
Section 10

HOW TO USE MID-AUTO MANUAL

1. In AUTO, while program is running press <SLIDE HOLD>.
2. Press <MID-AUTO MANUAL>.
3. All MANUAL mode controls such as jog, pulse wheel, and spindle on/off may now be performed.
4. To restart the program, jog the axes close to the point where the cut was interrupted.
5. Turn on any function that you previously turned off in step 3. (Spindle, engage spindle, etc.).
6. If the STM indicator light is blinking, you did not turn on all functions.
7. Turn SINGLE BLOCK “ON”, FEEDRATE OVERRIDE, JOG FEED and RAPID OVERRIDE to zero (or very slow).
8. Press <SEQUENCE RESTART>.
9. Slowly let the machine move back to the spot where you left off by increasing the JOG FEED dial.
10. Once the run light goes out, you can adjust your SINGLE BLOCK, FEEDRATE & RAPID settings.
11. Push <CYCLE START>, and the program should resume.

NOTE:

- Use extreme caution when re-starting the program. The machine will take the shortest path back to the location where you stopped it. Always jog the tool back to a location near the point where you stopped cutting. Be particularly careful with drills and end mills as the tool could crash into the part as it vectors back. The use of variables must be considered when selecting restarting methods.
Section 11

HOW TO USE QUICK EDIT

1. In AUTO.
4. Make necessary changes to part program.

![Quick Edit Example](image-url)
Section 12

HOW TO CREATE A PART PROGRAM

1. Select **EDIT**.
4. Type in file name and press <**WRITE**>.
6. Enter all program data.

- Main file names begin with alphabetic characters and are limited to 16 characters
- Main File extension: .MIN A main program is generally used when the machine is running one setup.
- Schedule Program File: .SDF A schedule program is generally used when the machine is running different setups from a pallet changer etc, multiple main programs are used and the schedule program is used to determine the order in which the main programs are executed.
- Library Program File: .LIB Subprograms and G code macros which are frequently used can be saved as library files. Library programs are stored in the operation buffer at power on, so they can be accessed at any time.
- System Subprogram File: .SSB These are subprograms written by the customer and stored in MD1.
- User Subprogram File: .SUB These are subprograms written by the customer and stored in MD1.
Section 13

HOW TO TRANSFER PART PROGRAMS

Here we will discuss transferring program files to and from an external USB storage device such as a pen drive or flash drive.

Transfer Part Programs from the Machine to USB:
1. Insert the USB storage device (machine should notice new hardware…please close that message).
2. Select EDIT.
3. Press [F1] “DIR DISPLAY”.
4. Press [F1] “MD1”.
5. Move the cursor to program you want to transfer.
6. Press [F5] “COPY” (pop-up window will ask where to send).
Transfer is now complete to confirm file is copied:

Before the external drive is removed

- Select the “Environment Setting Key” icon on the right hand side of the screen.

- Select “REMOVE HARDWARE”.

- Select “STOP” from the “Safely Remove Hardware” window.
- Select “OK” from the “Stop Hardware Device” window.
- “Safe to Remove Hardware” prompt should be displayed at this time.
- Remove hardware, and close window.
Section 13 (cont)

Transfer Part Programs form the USB to Machine:
1. Insert the USB storage device (machine should notice new hardware…please close that message).
2. Select **EDIT**.
3. Press [F1] “DIR DISPLAY”.
7. Move the cursor to program you want to transfer to MD1.
8. Press [F5] “COPY” (pop-up window will ask where to send).
Transfer is now complete to confirm file is copied:
11. Press [F1] “MD1” and confirm file is present.

**Before the external drive is removed**

- Select the “Environment Setting Key” icon on the right hand side of the screen.

![Environment Setting Key Icon](image)

- Select “REMOVE HARDWARE”.

![Remove Hardware Icon](image)

- Select “STOP” from the “Safely Remove Hardware” window.
- Select “OK” from the “Stop Hardware Device” window.
- “Safe to Remove Hardware” prompt should be displayed at this time.
- Remove hardware, and close window.